

REMARKS/ARGUMENTS

Claims 1-5 are pending in the application.

Claim 1 has been amended

Claims 3 and 5 have been canceled and such cancellation is without prejudice or waiver.

New independent claims 6 and 7 have been added. New claims 6 and 7 are basically claims 3 and 5, which have been rewritten in independent format. The Examiner has indicated that claims 3 and 5 would be allowable if rewritten to overcome the claim objections, set forth in the outstanding Office action and to include all of the limitations of the base claim and any intervening claims.

Claim 1 has been amended to address the objections/informalities raised by the Examiner and all antecedent basis have been provided in the amended claim.

SUMMARY OF INTERVIEW ON NOVEMBER 17<sup>th</sup>, 2004

Applicants' representative conducted an interview on November 17<sup>th</sup>, 2004; with Examiner Yam of art unit 2878. During the interview, the objections to the claims regarding sufficient antecedent basis were addressed.

The Mallory US Patent No. 4,945,200 reference was discussed and Applicants' representative pointed out that the criteria for determining the correct focus is quite different in Mallory than the present application. Applicants' explained that according to Mallory, et al. from col. 6, line 44 to col. 7, line 20, they use variance as the criteria for determining the correct focus. In Mallory, the optical focus is adjusted at a constant rate and the variance is then determined. When a threshold T is passed, the adjustment is done at a slower rate so as to allow

determination of the variance in smaller steps. Applicants' method (steps 2 and 3 in claim 1) does not use the variance but the local signal amplitude to determine the correct focus.

It was further discussed that the Applicants' criteria versus Mallory, et al. are different. The variance in Mallory is calculated according to the formula in col. 6, and basically it is the square of the standard variation of the amplitude between two pixels, averaged over all pixels. The local signal amplitude S2 on the other hand (determined according to equations 2-6 in the present application, page 5, and page 7, upper part) is determined in a different way.

#### THE REJECTION UNDER 35 U.S.C. § 103(a)

On pages 3-5 of the outstanding office action, the Examiner rejected Claims 1, 2 and 4 under 35 U.S.C. § 103 (a) as allegedly being unpatentable over Mallory, et al. US Patent No. 4,945,220 in view of Smith US Patent No. 4,371,866. For the following reasons, Applicant respectfully traverses this rejection.

The criteria for determining the correct focus is different in Mallory, et al. when compared to the present application. Mallory, et al. discloses from col. 6, line 44 to col. 7, line 20, the use of variance as the criteria to determine the correct focus. The optical focus is adjusted at a constant rate and the variance is determined. When a threshold T is passed, adjustment is done at a slower rate to allow determination of the variance in smaller steps. This is essentially what is done in the present application (steps 2 and 3 in pending claim 1), but Applicants do not use the variance but the local signal amplitude to determine the correct focus.

Applicant submits that, the criteria used in Mallory versus the criteria used in the present application differ somewhat. The variance in Mallory is calculated according to the formula in col. 6, which basically is the square of the standard variation of the amplitude between two pixels, averaged over all pixels.

In contradistinction, the local signal amplitude S2 on the other hand (which is determined according to equations 2-6 in the present application, page 5, and page 7, upper part) is determined differently. The word "local" in the present application does not mean "neighborhood" pixel, but rather it describes a local structure in the image ( e.g., a falling edge starting from the pixel nearest the optical axis.).

Applicant submits further that Smith does not cure the deficiencies of the Mallory, et al. teachings. As will be appreciated from the description to Fig. 1 in col. 2, of Smith, it can be seen that alternately the central and the outer parts of the optics are covered. The difference image obtained from those two images will give an edge-enhanced image (col. 3, lines 6-7, Fig. 1). The solution described by Smith does not match applicants' solution, since edge-enhancing is based on the difference of two images taken with different conditions for exposure even if the difference is called "CCF" (Fig. 5, col. 5 lines 38-40). In Applicants' solution, on the other hand, the CCF is determined solely from one image (equation 8, p. 8 of the present application) from a correlation of signals Y,...Y4.

What can be said form Mallory, et al. in combination with Smith is that (i) dependent on a signal criteria the shifting range between two measurements of that criteria could be variably chosen, depending on a threshold, and that (ii) a CCF can be used as a criterion for the auto focus.

The deficiencies that can not be appreciated from Mallory, et al. in combination with Smith is that (i) the criteria used in applicants' approach, in particular (ii) the use of different criteria dependent on the state of the focus, and (iii) a criteria for switching between the two criteria mentioned in (ii) which is independent from the exposure. The fact that it is not the signal amplitude but rather the ratio  $S_1/S_2$  that goes into rule (7) has the advantage that rule (7) is independent of the amplitude. As a consequence, it can already be employed before an optimal exposure regulation has been made. Thus, the calculations and changes in the focus position of the members for the autofocus can already take place during the exposure regulation. These advantages are described on page 7, of Applicant's specification.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art cited must teach or suggest all the claims limitations. See M.P.E.P. § 2143. Applicant asserts that the rejection does not provide an adequate suggestion or motivation for modifying Mallory, et al as suggested by the Examiner.

In determining a *prima facie* case for obviousness under 35 U.S.C. 103, it is necessary to show that the combination of prior art teachings is proper, and those teachings are sufficient to suggest making the claimed modifications to one of ordinary skill in the art. The distinctions

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listed above between currently amended claim 1 and Mallory are not described in Smith, hence the 103 rejections are overcome.

Accordingly, Applicants submit that the rejection of claims 1-5 under 35 U.S.C. 103(a) is improper for each, and certainly for all, of the above reasons. Applicants respectfully request reconsideration and withdrawal of the rejection, and an early indication of the allowance of these claims.

#### SUMMARY AND CONCLUSION

Entry and consideration of the present amendment, reconsideration of the outstanding office action rejections and objections, and allowance of the present application and all of the claims therein are respectfully requested and now believed to be appropriate.

Applicants have made a sincere effort to place the present application in condition for allowance and believe that they have now done so.

Any amendment to the claims that have been made in this amendment, which do not narrow the scope of the claims, and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered cosmetic in nature, and to have made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

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In view of the above amendments and remarks, it is respectfully submitted that the claims of the current Application are in condition for allowance. Reconsideration and withdrawal of the rejections are requested. The Examiner is invited to contact the undersigned at 703-418-2777 if he feels that further discussion may facilitate the resolution of any outstanding issues. An early indication of a Notice of Allowance is earnestly solicited.

Respectfully submitted,



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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In re of the Application of**

Thomas Marold

Serial Number: 10/070,580

Filed: August 9, 2002

## For: AUTOFOCUSING METHOD FOR TELESCOPES OF SURVEYING INSTRUMENTS

**Group Art Unit: 2878**  
**Examiner: Stephen Yam**



**RESPONSE TO OFFICE ACTION DATED JUNE 29, 2004**